



GUIDANCE ON
RESEARCH DISSERTATIONS
WRITTEN FOR PURPOSE

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INTRODUCTION

This guide has been written as an aid to trainees intending to undertake a project, and submit a dissertation, under Membership Regulation M12(a), for whom it assumes the perspective of a trainee in UK higher specialist training, enrolled under the new curriculum (after 31 July 2007). However, much of the advice will also be useful to other candidates, including old curriculum trainees and those embarking on a university degree that may lead to submission under Regulation M12(c). It should be read as advice and not be seen as a substitute for the specific Regulations, nor should it be used inflexibly or be seen as the only way to achieve the objective. Each dissertation is unique.

While many trainees choose a project which could be described as 'research' (either primary or secondary), it is not essential to undertake a narrowly academic research project. Instead, the main focus should be on the skills required of specialist practice in defining questions for study, gathering evidence, and interpreting and presenting evidence effectively.

The key to success is planning, which will require intermittent attention throughout the early period of training. There is an understandable tendency to concentrate on passing the examination components of Membership and leave consideration of the dissertation until the later stages of training. This is unwise; you should start to think about your dissertation during the first year of training (generally ST3). Experience suggests that developing a good idea and laying the foundations for a good project take time. In any event, a delay in submission could mean a delay to completion of training if you find you need to revise and resubmit.

Read the journals, go to conferences and meetings and try to familiarise yourself with the current topical areas in occupational medicine and with the methods that are used to seek evidence and answer questions. Then try to match this with your own interests and occupational health practice. Discuss the question you have in mind with experienced colleagues, including those with knowledge of research. This will also help you with your preparations for the examinations.

The quality standard being sought is that of a university-assessed MSc or peer-reviewed research publication. Candidates often seek academic support and this is strongly encouraged.

PICKING A TOPIC

The choice of project is largely up to you as long as it demonstrates mastery of a subject within the broad field of occupational health, with well-defined aims, an adequate literature search, appropriate methods, sufficient data, logical and discriminatory presentation and interpretation of results, and contextualisation within the field. Your study should be of interest to the generality of specialists in occupational medicine and should contribute usefully to the evidence base of the specialty. (There are many gaps in our research base and other areas where findings require confirmation.)

Dissertation ideas commonly arise from:

- Everyday questions about practice,
- Observed variations in practice,
- Challenging/checking accepted practice, where it lacks an evidence base,
- Topics of debate and controversy, and
- Apparent gaps in the evidence base.

Such topics may arise naturally out of a question during your work or may feature in the editorial and letter columns of journals, the presentations at meetings, and the discussion forums of special interest groups. Studies based on an outcome of practice have the benefit of being of interest to the employer as well as to the specialty.

Another aspect of evidence-based practice is reviewing the results of studies published in the literature. A literature review (in which no new data are collected) is an acceptable dissertation, but the same degree of rigour should be applied as for a project in which primary data are gathered. You will need to explain why you undertook the review and what methods you used to select and critically appraise the published studies. Good reviews begin with very clearly defined questions. They are systematic in their methods and apply precise rules that others could also follow with the same result e.g. defining databases, periods of inquiry, inclusion and exclusion criteria, key search terms, and quality assessment criteria. They also spell out the strengths and weaknesses of the chosen method and the implications for practice and/or future research. Familiarise yourself with the process and the standard.

Finally, you might consider conducting and reporting a substantial audit on a topic relevant to your occupational health practice or the health and safety arrangements of your employer. This should meet the general standards of a dissertation, and should thoroughly evaluate the background literature, formulate a well-defined study question(s), define and employ appropriate methods and measures, include an appropriate statistical analysis, draw sensible conclusions, and propose (and ideally implement and evaluate) suitable follow-on actions and changes of practice. The standard should be no less than that of work submitted in another permissible category.

When planning your project, read the 'research competencies' section of the Faculty's Higher Specialist Training Curriculum. These are competencies expected in specialist practice and you will find that many are covered elsewhere in your training e.g. in researching unfamiliar medical conditions or workplace regulations, in audit projects within sectoral groups such as ANHOPs, and in policy review and development work for an employer. There is no need to aim to cover every competency within your dissertation, but they are a useful guide when planning.

SUBMITTING THE OUTLINE PROPOSAL

There is no need to submit an outline proposal to the Faculty if you intend later to submit 'equivalent evidence' (such as a MSc dissertation) but it is good practice for all trainees to write such a proposal. You must discuss your thoughts about the dissertation with your educational supervisor, who will need to sign off your proposal and confirm that you have adequate resources, support, and training. They will be an important source of professional advice and an important link with the management structure of your employing organisation. If your study will involve access to workers and workplaces your supervisor will advise you about what is feasible within the organisation. You can identify and discuss any ethical issues and ensure that the necessary resources will be made available to you.

Once your study has evolved to be more than just thoughts you must focus your attention on how you are going to conduct it. You must pay a lot of attention to this aspect of the proposal. It is probably a good idea to discuss your proposals with someone who has some experience in research: an academic at your nearest university, perhaps an epidemiologist or a statistician, depending on what you are going to do. The outline proposal should explain the rationale for the study and explain how you are going to do it in no more than 1,000 words. In a nutshell:

- What are you going to do?
- Why do you want to do it?
- How will you do it?
- Who will be involved?
- Where will it happen?
- When are you going to do it?
- How will ethical issues and permissions be handled? (e.g. Do you have access to the study population and the agreement of line managers? How will you address data confidentiality?)

Formulate a clear question that you wish to answer. Thinking about how you answer the question will help you to identify the factors that you need to take into account when interpreting the results.

Be as precise as possible when defining study groups, diagnostic categories, measurements of exposure, or any statistical methods that you envisage using. Be realistic about what you hope to achieve. Are you likely to recruit enough people or obtain a sufficient number of measurements? Will there be enough time for the study? What sort of things might go wrong? How will you address these problems? A plan of work and timeline will help you prepare. **Try to ensure you include enough information in your outline to show that your project is properly considered and feasible. If you do not supply enough information, then the feedback you will receive from the Faculty reviewers can only be limited.**

The outline proposal must be submitted to the Chief Examiner (Research Methods). The Faculty recommends that it be submitted no later than the 18th month of full-time training (or part-time equivalent). The Chief Examiner will select two reviewers. The review of the outline proposal is a rapid screening process with the aim of providing quick informal advice on improving the protocol. Necessarily, such advice will be limited; the Faculty cannot issue detailed and iterative advice: it will be up to the candidate to flesh out and develop the full detail of their project with the help of their supervisor or academic advisors. It is important to appreciate that receiving feedback is not a guarantee that your assessors will accept the final submission as of a satisfactory standard.

WRITING THE DISSERTATION

If you are in higher specialist training, your educational supervisor must be involved, and will be a valuable source of advice and encouragement. Occasionally it may be necessary to adjust the direction of your work but there is no need to submit a new outline proposal.

The dissertation should be written in a similar fashion to a scientific paper. It will have gone through a similar gestation period and will have followed the same developmental processes. The assessors will view your dissertation as would journal referees. It should be about 8,000 to 10,000 words in length. The number of words

should be stated on the title page. Assessors may refuse to assess dissertations that are longer than 10,000 words and no credit will be given for exceeding this limit.

The presentation will be taken into account in the assessment:

- Word number and other aspects of the format must conform to current MFOM Regulations and follow any relevant guidance associated with the Regulations.
- Written English must be clear and of good quality, with accurate spelling and grammar, and a clear layout.
- Tables and figures must be clear and accurate, tidy and well laid out, without duplication of information.
- The table of contents, any abbreviation list, and the pagination must be accurate.
- References must be cited according to a recognised convention, and referencing must be consistent and accurate.
- Quotations from other documents must be correctly attributed, without plagiarism.
- Candidates should provide an Acknowledgements section containing a detailed statement of their own role in the project and which states clearly the roles of any advisers or colleagues. The respective contributions of other parties should be clear to the assessors.

Most projects can be reported in sections under the following headings:

- Abstract
- Acknowledgements
- Introduction
- Methods
- Results
- Discussion
- References
- Appendices (if appropriate)

Subheadings within these sections should be used where appropriate to aid clarity and understanding.

Introduction: This should describe the basic problem in the context of your industry/factory/workplace leading to a review of the literature, highlighting current knowledge, previous investigations, and any conflicting evidence. Strengths and weaknesses of previous investigations and their methodology might be identified. A clearly defined aim for your project should emerge naturally from this assessment; if possible it should be consolidated into a single sentence. Assume the reader does not know anything about the subject.

You should have collected the relevant references and be familiar with their content and applicability to your work, but you need not use all of them, especially in the introduction (the discussion section will normally include a comparison with other findings and another opportunity for expansion). Plan carefully how you use and cite references; you should have seen and read every reference you cite. Ensure that you attribute references correctly, reporting findings or results rather than speculation unless this is appropriate. Are your references a primary source of information or do they quote others?

Methods: This section will describe in detail the methods used to investigate the problem, including statistical techniques. It will identify the what, how, and when of the data collected, the subjects and their selection (if appropriate), comparison populations and the reason for their selection. Investigations should be defined - again who, where, when, how are the questions to be addressed. Use of questionnaires

should be stated together with justification or validation. Ethical issues, permission/consent, and co-operation from management and trade associations should be covered if appropriate to your investigation and any relevant correspondence with an ethics committee appended. The Methods section should also address the analysis of your data; the methods or tests to be used, justification for the number of subjects to be used; an assessment of the power of your study may be appropriate, together with your strategy to minimise errors and biases. Finally, what external assistance will you be using? Analysis of data and of air samples are two obvious examples where you may need extra help; this is allowed with acknowledgement.

Results: These must be presented in the most appropriate form. Extensive use should be made of tables, or figures and graphs when these convey the message better. A narrative of the results should be restricted to highlighting the most important results and should refer the reader to tables etc. rather than simply repeat in word form what may be obvious from tables. However, certain differences, say between subjects of interest and referents, or other important comparative information, should be identified briefly - if only to direct the reader to a specific table. A clear statement should be included on the findings in relation to your study question(s).

Discussion: Try not to repeat your description of results in this section, other than by way of a brief summary or drawing together of the threads. Instead, your discussion should compare your findings with previous work and should identify the strengths and weaknesses of your study compared to others. Methodological problems should be discussed and their likely influence on your results, focusing on such things as measurement error, confounding, biases and statistical uncertainty. Speculation may be appropriate on the reasons for unexpected findings. Finally, you will have to draw the discussion to a close and make firm conclusions on your work. These may be strongly positive, inconclusive, or even negative. Have you achieved your aim? How can your findings be applied? Is further work required, or can you make recommendations for practice?

References: These should either be in the Vancouver or Harvard style; remember it is quality and relevance of references that count, not quantity.

Appendices: These may be required for very large tables or to record supplementary analyses of background interest which would be inappropriate in the text of your dissertation. Other information e.g. study questionnaires, Approved Codes of Practice, procedural documents, or your research ethics committee approval letter (if required) can also be placed in an Appendix.

Abstract: The abstract should be written last. In it you should consolidate the most important features of the work including the objective, a very brief summary of the methods, principal results, conclusions, and recommendations. The use of structured headings is recommended. It is an exercise in self-control and good writing to achieve a summary within the limit of no more than 300 words, but it can be done. Many of the papers read in pursuit of your dissertation will have abstracts of varying quality and so you should have an idea of what makes a good abstract and which features to include and which to avoid.

Style: The dissertation should be written concisely in good English. Sentences should be short, precise and of simple construction. (It is a good discipline to go through the text carefully thinking about this, and whether some sentences of tangential relevance could be removed altogether – less is often more.)

You should avoid jargon (both medical and 'management') and unnecessary convoluted. Where abbreviations are required they should be written in full the first time and followed by the abbreviation in brackets. Subsequently the abbreviation should be used,

e.g. Health & Safety Executive (HSE). Follow the normal conventions of scientific writing including standard units of measurement. Tables and figures should be numbered and should have a title. Large tables and figures should be placed on individual pages adjacent to the relevant text. The table of contents and page numbering must be accurate. Citations must be accurate and in the correct style. Each main section should start on a new page.

The essence of a good paper or dissertation lies in its readability. It should be a pleasure to read. If its style is difficult to read, then its message will be hidden and the sympathy of the reader lost. Scrupulous attention to detail must be the watchword at every stage. Proof reading is essential. Get others to proof read it too, including someone divorced from the subject at hand (even a layperson); a fresh pair of eyes may spot where the sense or logic is flawed. Remember that word-processor spellcheckers will not pick up on inappropriate spellings of words (e.g. principal/principle).

SUBMITTING THE FINAL DISSERTATION

You should not submit your final dissertation until you have agreed its final form with your educational supervisor, and with any other advisors. Please ensure that all proof reading has been done and errors corrected before you submit to the Faculty. Errors at this stage will lead to delay. Following receipt of your final submission, the Faculty will appoint two independent assessors to evaluate your work (usually, these will be specialist occupational physicians).

Within about 2 months of assessors being recruited you should receive written feedback on the assessors' views. They will agree a joint mark within bands (excellent pass, good pass, clear pass, marginal pass, marginal fail, clear fail) and will provide structured feedback to assist you. If you receive a fail mark, please bear in mind that feedback is intended to be constructive and is a part of the learning process. Experience suggests that few candidates ultimately fail to reach the required standard.

The assessors may also suggest areas in the curriculum which are not covered in the dissertation and which you may need to address elsewhere in your training.

A provision exists in the Regulations for you to appeal a decision by writing, in the prescribed timescale, to the Chief Examiner (Research Methods) setting out the basis for your appeal. A simple disagreement with the assessors' decision is not a valid basis for an appeal.

RECOMMENDED READING

Hall GM. How to Write a Paper (5th ed). BMJ Books, 2013. (ISBN 9780470672204)

Greenhalgh T. How to Read a Paper: The Basics of Evidence-based Medicine (4th ed). Wiley Blackwell, 2010. (ISBN 9781444334364)

Coggon D. Statistics in Clinical Practice (2nd ed). BMJ Books, 2002. (ISBN 0727916092)

Coggon D, Barker DJP, Rose G. Epidemiology for the Uninitiated (5th ed). BMJ Books, 2002. (ISBN 0727916041)

Campbell MJ, Swinscow TDV. Statistics at Square One (11th ed). BMJ Books, 2009. (ISBN 9781405191005)

Oppenheim AN. Questionnaire Design, Interviewing and Attitude Measurement (3rd ed). Continuum, 2000. (ISBN 9781855670433)

Gowers E, Greenbaum S, Whitcut J. The Complete Plain Words (3rd ed). David R Godine, 2004. (ISBN 1567922031)

Verbeek J, Ijaz S. Systematic Reviews of Occupational Safety and Health. In: Venables KM (ed). Current Topics in Occupational Epidemiology. OUP, 2013. (ISBN 9780199683901)

Jsiwek J, Gourlay ML, Slawson DC, Shaughnessy AF. How to Write an Evidence-Based Clinical Review Article. American Family Physician 2002;65:251-8.

Recommendations from the International Committee of Medical Journal Editors
<http://www.icmje.org/>

If planning a literature review (all web addresses current on 20/03/14):
<http://www.york.ac.uk/inst/crd/>
<http://www.sign.ac.uk/guidelines/fulltext/50/section6.html>
<http://osh.cochrane.org/>

SUMMARY OF ROLES AND RESPONSIBILITIES

The Faculty-appointed protocol reviewers: Reviewers (who may not be occupational physicians) are appointed at the stage of protocol submission by the Chief Examiner (Research Methods). Their main task is to provide rapid informal advice on any improvements which can be made and pointers toward relevant resources. It is up to the candidate to flesh out and develop the full detail of the proposal.

The Faculty-appointed assessors: Assessors (who are usually specialists in occupational medicine) are appointed at the stage of final submission by the Chief Examiner (Research Methods). Their main task is to judge the suitability of the submission against the criteria for Membership, and to advise on whether the required standard is met.

The educational supervisor: The educational supervisor should encourage early identification of a research topic and submission of the outline proposal. Progress on this is likely to feature in the Annual Review of Competencies Progression (ARCP), and the Faculty recommends an outline proposal to have been submitted no later than the end of the 18th month of full-time training (or part-time equivalent).

The supervisor should ensure that any project is realistic and that there will be adequate resources to sustain the work until completion. Progress with the dissertation should be monitored, via regular formal meetings. This will allow problems to be identified at an early stage and solutions identified. The Faculty expects that the supervisor will advise the candidate on the quality of the final submission, although the final responsibility for the standard of the final submission rests with the candidate.

Educational supervisors who do not feel well versed to supervise their trainee's dissertation should discuss with the trainee how adequate support and supervision can be brought to bear (e.g. they may wish the trainee to enrol with an academic centre or an independent academic supervisor).

The Faculty of Occupational Medicine: The process to be followed is detailed in the MFOM Regulations. The Training Programme Manager will be the first point of contact for candidates, supervisors and assessors. The Chief Examiner (Research Methods)

appoints reviewers and assessors and should be contacted for any appeal. The Director of Training will advise on training issues that might affect the submission of the dissertation.

The Postgraduate Deaneries: The Postgraduate Dean must be satisfied that specialist training in occupational medicine conforms to nationally set criteria for the selection of trainees, the delivery of the training programme, the methods of assessment of progress and for determining satisfactory completion of specialist training. Specialist training is time limited and, in general, delays in achieving agreed milestones and outcomes will be interpreted as a failure to progress. Progress with the dissertation will be assessed at ARCP review.

The candidate: The production of a dissertation tests a range of skills, knowledge and attitudes such as self-motivation, organisation, communication, networking, study design and critical appraisal of information. All candidates must accept the responsibility to produce a dissertation of an acceptable standard in a timely fashion. Support from the educational supervisor and the Faculty will be available within the training programme and it is important for the trainee to make appropriate use of such support.



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